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(54) Process for the drying of a hydrocarbon stream

(57) The invention concerns a process for the continuous drying of a hydrocarbon stream and comprises contacting the hydrocarbon stream with an ionic, liquid drying agent of a salt of a fluorinated sulphonic acid.

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triflate in a counter flow contact column 2 at a temperature of 20°C in a continuous operation. The ionic liquid was charged through line 10 at a feed rate of 109 g/h to the top of the column and withdrawn at the bottom. The hydrocarbon stream was charged at a feed rate of 3383 g/h to the bottom of the contact column and withdrawn from the top. The contact column was 0.5m high with an ID=20 mm and packed with 200 ml 4 mm glass helices.

[0020] The wetted ionic liquid withdrawn from the contact column 2 was charged to the top of stripping column 6 in which the ionic liquid was dried by stripping in counter flow with a stream 8 of superheated heptane (150°C) before being withdrawn at the bottom of the stripping column and returned to the top of the contact column. The wet ionic liquid was charged to the top at a feed rate of 109 kg/h at ambient temperature and the dried ionic liquid was withdrawn from the bottom of the stripping column and returned to the hydrocarbon contact column.

[0021] Heptane vapour was fed to the stripping column at 1140 g/h. The stripping column was 0,4 m high with ID = 30 mm and filled with 300 ml 4 x 4 mm stainless steel Rashig rings.

[0022] The results are given in Tables 1 and 2 below.

Table 1

Contact Column (Hydrocarbon drying)	
Hydrocarbon flow (feed, g/h)	3383
Ionic liquid flow, (g/h)	109
Before treatment (Wet hydrocarbon feed, ppm water)	80
After treatment (Dry hydrocarbon product, ppm water)	5.5
Hydrocarbon feed temperature (°C)	20
Ionic liquid feed temperature (°C)	20
Hydrocarbon / Ionic liquid rate	31

[0023] The results show that the water content in the hydrocarbon feed is reduced from 80 ppm to 5.5 ppm.

Table 2

Stripping Column (Ionic liquid drying)	
Ionic liquid flow, (g/h)	109
Heptane flow, (g/h)	1140
Before treatment (Wet ionic liquid, ppm water)	2632
After treatment (Dried ionic liquid, ppm water)	198
Ionic liquid feed temperature (°C)	Ambient

Table 2 (continued)

Stripping Column (Ionic liquid drying)	
Heptane feed temperature (°C)	98

Example 2

[0024] This experiment was performed in the same equipment as used for Example 1. However, the flows were changed, as illustrated in Tables 3 and 4 below, to give a hydrocarbon flow/ionic liquid flow ratio of 4 in the contact column. The actual flows are shown in the Tables.

Table 3

Contact Column (Hydrocarbon drying)	
Hydrocarbon flow (feed, g/h)	1609
Ionic liquid flow, (g/h)	409
Before treatment (Wet hydrocarbon feed, ppm water)	76
After treatment (Dry hydrocarbon product, ppm water)	3.5
Hydrocarbon feed temperature (°C)	20
Ionic liquid feed temperature (°C)	20
Hydrocarbon / Ionic liquid rate	4

[0025] The results indicated in Table 3 show that the water content in the hydrocarbon stream was reduced from 76 ppm to 3.5 ppm.

Table 4

Stripping Column (Ionic liquid drying)	
Ionic liquid flow, (g/h)	409
Heptane flow, (g/h)	1140
Before treatment (Wet ionic liquid, ppm water)	217
After treatment (Dry ionic liquid, ppm water)	88
Ionic liquid feed temperature (°C)	Ambient
Heptane feed temperature (°C)	98

Claims

1. Process for the continuous drying of a hydrocarbon stream comprising contacting the hydrocarbon stream with an ionic, liquid drying agent of a salt of a fluorinated sulphonic acid.

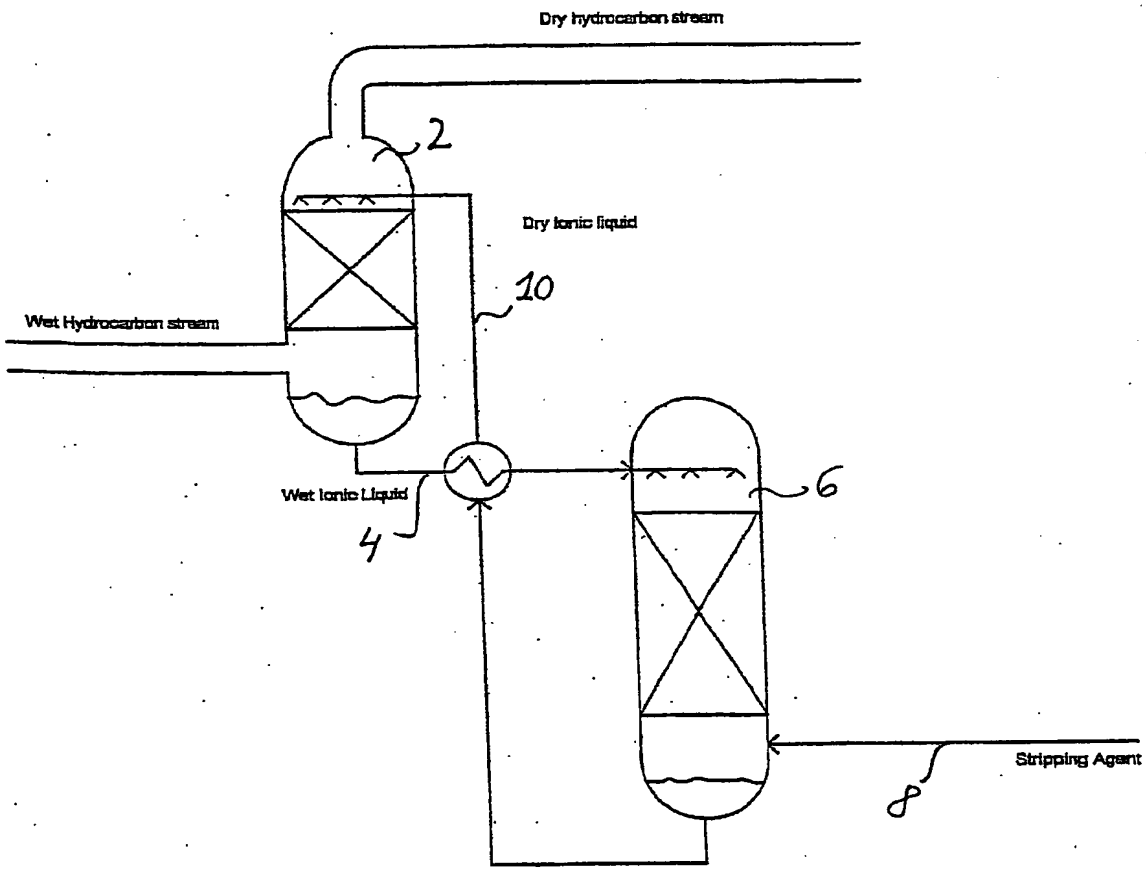
Dry hydrocarbon stream
2
Dry Ionic liquid
10
Wet Hydrocarbon stream
Wet Ionic Liquid
4
6
Stripping Agent
8

Fig. 1

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 02 2859

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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